AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0015] with the following replacement paragraph:

[0015] The rotational robots, e.g., between about 2 and about 10 robots, of the system optionally each comprise one or more grippers configured to transport the sample holders, which grippers optionally comprise a sensor structured to determine a location of the gripper apparatus relative to the object. In addition, the grippers optionally comprise a deflectable member structured to couple the gripper apparatus to a robotic member, which deflectable member is structured to deflect when the gripper apparatus contacts an item with a force greater than a preset force. **In some embodiments, at least one of the rotational robots includes a grasping mechanism that comprises moveably coupled arms that are structured to grasp an object, wherein at least one arm comprises a pivot member having a support surface to support the object and a height adjusting surface that pushes the object into contact with the support surface when the arms grasp the object.**

Please note that exemplary support for the new text in this replacement paragraph is found in claim 1 of U.S. Ser. No. 09/793,254 (now US 6,592,324), which was incorporated by reference into the subject application (see, e.g., paragraph numbers [0058] and [0214] of the subject application).

Please add the following six new paragraphs immediately after paragraph number [0039] and before the heading "DETAILED DISCUSSION OF THE INVENTION".

FIG. 15 is an elevation view of a robotic arm gripper mechanism constructed according to one embodiment of the present invention.

FIG. 16 is a perspective view of the gripper mechanism illustrated in FIG. 15.

FIG. 17 is a plan view of the gripper mechanism illustrated in FIG. 16.

FIG. 18 is a perspective view of the gripper mechanism and sample plate illustrated in FIGS. 15 and 16.

FIG. 19 is an elevation view of the pivot members and sample plate illustrated in FIG. 18.

FIG. 19A is an elevation view of the pivot members and sample plate illustrated in FIG. 19.

Please note that exemplary support for these six new paragraphs is found at Col. 3, lines 24-26, lines 27 and 28, lines 31 and 32, lines 33 and 34, lines 35 and 36, and lines 37 and 38, respectively, of U.S. Ser. No. 09/793,254 (now US 6,592,324), which was incorporated by reference into the subject application (see, e.g., paragraph numbers [0058] and [0214] of the subject application). Please also note that figure numbers recited in these six new paragraphs have been changed relative to the numbering in the '324 patent to correspond to the figure numbering in the subject application.

Please add the following eight new paragraphs immediately after paragraph number [0058] and before paragraph number [0059].

Referring to FIG. 15, the robotic gripper mechanism in accordance with one embodiment of the invention is illustrated and designated generally by the numeral 10. The robotic gripper mechanism 10 is an automated and robotic gripper for grasping, moving and positioning objects. The preferred embodiment is constructed to grasp sample plates, but other types of objects can be grasped by the robotic gripper mechanism 10. For example, petri dishes, test tubes, vials, crucibles, reaction

vessels or flasks, or any type of object that is employed in a process requiring accurate positioning.

In the preferred embodiment illustrated in FIG. 15, the robotic gripper 10 comprises a grasping mechanism 20 movably connected to a boom 12 that is movable relative to a base 14. Controller 15, comprising a general purpose computing device, controls the movements of the grasping mechanism 20 and the boom 12 in a work perimeter that includes one or more stations 30 that can receive sample plates 25. The grasping mechanism 20 is designed to grasp the sample plates 25 and move them from one station 30 to another station 30 or to other locations within the work perimeter of the robotic gripper mechanism 10. Although the disclosed example has one work perimeter, more work perimeters, each employing a robotic gripper mechanism 10, may be utilized, depending upon the specific application.

Referring again to FIG. 15, the boom 12 is capable of about 360 degrees of rotation. In addition, the boom 12 can move vertically and horizontally to align the grasping mechanism 20 with higher or lower stations 30.

The boom 12 is configured to extend and retract from the base 14. This defines the work perimeter for the robotic gripper mechanism 10. Stations 30 are positioned within the work perimeter of the boom 12 as are hand-off areas or other areas that are configured for receiving objects grasped and moved by the grasping mechanism 20. For example, sample plate 25 is positioned on station shelf 33 and can be grasped by grasping mechanism 20 and moved to another position by boom 12. In a preferred embodiment, the sample plate 25 comprises several individual wells, with each well configured to hold a sample. For example, a sample plate 25 may contain 384, 967, or 1,536 wells. The grasping mechanism 20 can grasp many other types of sample plates. Other types of devices, such as semiconductor wafers, CDs, medical devices and other items, may be grasped and moved by the grasping mechanism 20.

Referring to FIG. 16, grasping arms A and B extend from the body 22 and include pivot members 35. Positioned adjacent to the pivot members 35 are sensors 55 and stops 50. The sensors 55 communicate with the controller 15 and determine the location of objects adjacent to the arms A and B. In a preferred embodiment, the sensors 55 are optical sensors, but photoelectric, infrared, magnetic, or other suitable sensors can be employed.

Referring to FIGS. 17 and 19-19A, the pivoting members 35 are pivotally mounted to the arms A and B. A channel 37 extends along a long axis of each pivot member 35 and, as shown in FIG. 19, includes a horizontal surface 40 and an angled surface 45. In a preferred embodiment, the pivot members 35 comprise separate pieces which are pivotally mounted to the arms A and B. An alternative embodiment robotic gripper mechanism 10 may employ grasping arms A and B that include channels 37 in the arms A and B. The arms A and B would pivot with respect to the body 22, thereby eliminating the need for separate pivot members 35. The grasping arms A and B and pivot members 35 preferably are constructed from a metal or alloy, such as aluminum, but dielectric materials, such as plastic or other types of materials, can be employed.

As shown in FIG. 18, the sample plate 25 comprises a plurality of closely arranged sample wells. Each well in the sample plate 25 is square with each side of the well having a length of about 2 millimeters. During a high throughput process, discrete fluid samples may be deposited in each well, requiring positioning accuracy to within 0.1 millimeters. The robotic grasping mechanism 10 of the present invention is capable of this positioning accuracy.

Referring to FIGS. 19 and 19A, the pivot members 35 comprise a substantially horizontal surface 40 and an angle surface 45 that combine to form a channel 37. As the pivot members 35 approach the sample plate 25, the vertical position of the sample plates 25, defined by the z-axes, may not correspond with the pivot members 35. In this case, when the pivot member 35 engages the sample plate edge 27, the

edge 27 may contact the angled surface 45. As the grasping arms A and B continue to compress together, the grasping arms A and B pivot slightly, pushing the sample plate 25 against the horizontal surface 40. By including the angled surface 45 on the pivot members 35, the vertical position, as defined by the z-axis, is always known because the angled surface 45 forces the sample plate 25 to engage the horizontal surface 40. This is in contrast to conventional gripping devices that do not define the vertical position of the grasped object. In addition, with conventional grasping devices, an object that is misaligned relative to the x-axes, that is, angled relative to the conventional grasping device, will be grasped at an angle, thereby only establishing a single point of contact on each side of the object.

Please note that exemplary support for these eight new paragraphs is found at Col. 4, lines 4-14, Col. 4, lines 15-32, Col. 4, lines 37-52, Col. 5, lines 18-25, Col. 5, lines 26-40, Col. 5, lines 48-55, and Col. 6, lines 10-30, respectively, of U.S. Ser. No. 09/793,254 (now US 6,592,324), which was incorporated by reference into the subject application (see, e.g., paragraph numbers [0058] and [0214] of the subject application). Please also note that figure numbers recited in these eight new paragraphs have been changed relative to the numbering in the '324 patent to correspond to the figure numbering in the subject application.